In classic scientific experiments we follow the rules that we:
Change one thing (independent variable), measure one thing (dependent variable) and everything else stays the same".

We call this type of experiment "**closed**" because only one variable is permitted to effect a change. For example, scientists tested to see the effect of increasing carbon dioxide levels on the internal temperature of a closed container in a controlled temperature area of the laboratory. The experiment produced the following result.

CO_2 in container (%)	Temperature (ºC)
0.02%	20ºC
0.03%	22ºC
0.04%	24ºC
0.05%	26ºC
0.06%	28ºC

(fabricated results for purposes of exercise)

Graph these results below.
Which measurements should be placed on the vertical (y) axis?

_____

Which measurements should be placed along the horizontal (x) axis?

_____

Which type of graph would you chose and why?

_____

Title   1 mark
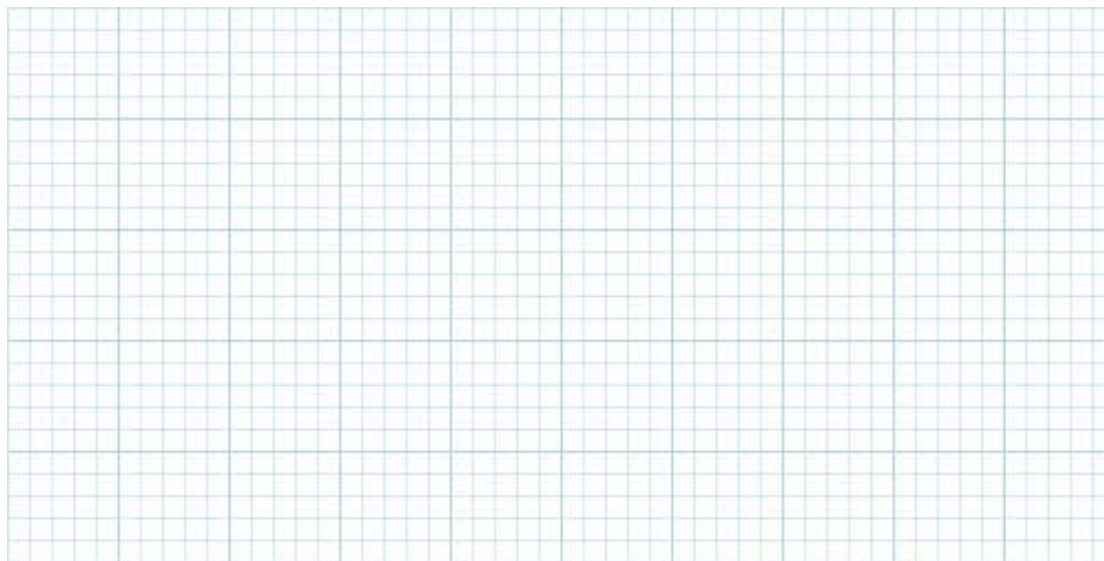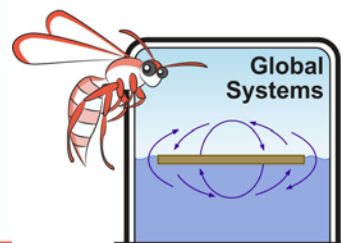Axes labelled   2 marks
Graphing points accurately positioned and graph drawn by pencil   2 marks

In Science we try to collect data that is both *precise and accurate.*

How could we make this data more accurate?

_____

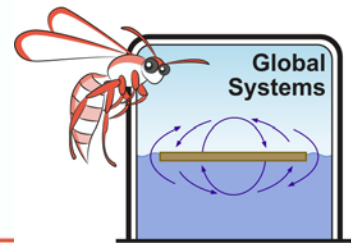How could we make this data more precise?

_____

Run a quick five-minute survey of twelve of your classmates to find out the answer to a simple question such as "Girls make better scientists than boys". Your teacher may suggest another survey question for you to use.

Enter your data in the table provided below

Student #	Yes	No	Student #	Yes	No
1			7		
2			8		
3			9		
4			10		
5			11		
6			12		

If we only used data from the first two students, what percentage of students said yes?

_____

If we only used data from the first 5 students, what percentage of students said yes?

_____

If we used data from all twelve students, what percentage of students said yes?

_____

The larger the group surveyed, the more accurate the response will be.

In this example, does the level of carbon dioxide affect the temperature inside the container?

_____

How would you describe the relationship between carbon dioxide levels and temperature?

_____

From these results, can we now directly relate world rises in average temperature to increased levels of carbon dioxide? Explain your answer.

_____

_____

If we repeated the experiment using only water vapour and found the same results, could we then say that a mix of carbon dioxide and water vapour will produce the same degree of heating as either gas?

_____

_____

Which other atmospheric gasses would we have to consider if we wanted to explain recent atmospheric warming?

_____
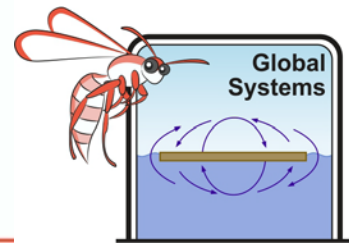
What did Milankovic suggest also affected the average temperature at Earth's surface over time?

_____

Is it possible to have a single controlled experiment that could include all these variables?

_____

Climate scientists work to produce models of change over time, taking into account many factors and their possible interactions.

Model of predicted increase in average surface temperatures over time
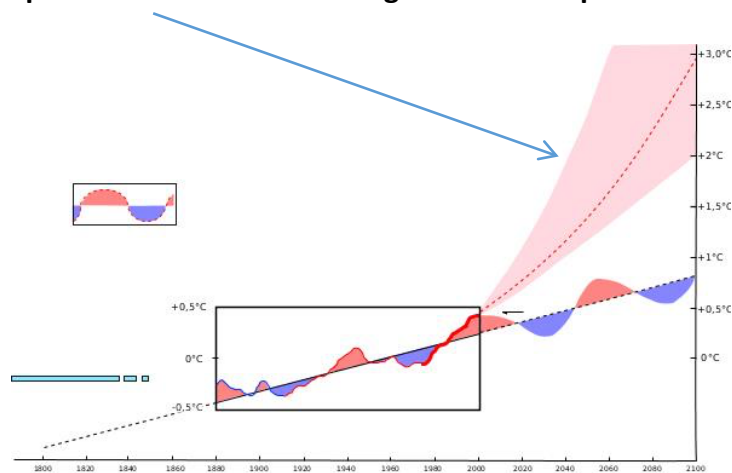
How will we know if we are using a good model?

_____

Where in Australia can we find good scientific data and predictions on climate change?

_____

Why do scientific models and predictions change over time?

_____

_____